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ABSTRACT

The development, validation, and reliability of the Affective Domain Measuring Scale are described. Values are presented with the techniques used in calculations. The scale is included with the scale value (the median or 50th percentile) for each item. (SA)

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AFFECTIVE DOMAIN MEASURING SCALE (ADMS)

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Title: Affective Domain Measuring Scale (ADMS)

Factors: Secondary (9-12) students' affective behaviors toward science

Format: Respondent checks (✓) those statements he/she agrees with and places a cross (X) beside those he/she disagrees with. The instrument contains two forms. One form may be used in the pre-testing and the other in post-testing or both forms used together in both settings.

Population: 300 secondary (9-12) students enrolled in science classes (Illinois)

Reliability: Test - retest method;
r = .85 (Pearson Product-Moment), N = 190

Split-half method;
r = .86 (Spearman-Brown) at the beginning of the semester, N = 190
r = .89 (Spearman-Brown) at the conclusion of the semester, N = 190

Norms: The whole test and both forms have median scores of 5.8. Student scores 5.8 or greater represent positive affective feelings toward science and less than 5.8 negative affective feelings.

Validation: Point biserial correlation used to provide a "discriminatory power" which provides a measure of the validity of each item compared to the test as a whole (items having a probability value greater than .05 were removed from the test). N = 190

Construct validity was checked, using a coefficient of correlation (Pearson Product-Moment) between ADMS and two other instruments, r =.64 and r = .26.

Reference: Downs, Gary E. "A Comparison of the Affective Behavior of Students Enrolled in Various High School Science Courses as Measured by an Instrument Developed Using the Affective Domain Continuum." Unpublished doctoral dissertation, University of Northern Colorado, 1972, p. 162.
University Microfilms Order No. 72-23,799.

DEVELOPMENT, VALIDATION, AND RELIABILITY OF THE AFFECTIVE DOMAIN MEASURING SCALE (ADMS)

Nondisguised-structured instruments generally include scale values for each item. The scale value assigned to each statement can be determined by using different techniques. For this study the Thurstone method was used to develop the scale values for the statements. This method uses a sizable number of judges who rate each statement from one (unfavorable) to eleven (favorable).

The first four categories of Krathwohl's continuum with their sub-categories were used as a basis for writing the initial one hundred and ten statements of the Affective Domain Measuring Scale (ADMS). The responses of 300 high school science students to the statements were used as a basis for establishing the scale values.

Tabulations were made using the 300 student responses and values were obtained for the 25th percentile, 50th percentile, and the 75th percentile wherein the median or the 50th percentile represented the scale value for each item.

A useful statistical criterion for determining whether the one hundred and ten statements were good or bad items was provided by using the width of the range between the 25th and 75th percentiles. This is termed the "Q" value. A large "Q" indicates lack of agreement among the judges suggesting something is probably wrong with the statement. A small "Q" suggests good agreement among judges and a good measurable item for the scale. Items with a "Q" value greater than 3.5 were removed from the instrument. A total of twenty-one items were removed using this statistic. Further discrimination was done by eliminating several items having the same scale values. The use of these two techniques reduced the number of items to seventy-two for the point biserial correlation test.

In order to use the point biserial correlation statistic on the ADMS, data had to be collected. Responses were obtained from 190 students enrolled in eight high-school science courses. The point biserial correlation provides a "discriminatory power" measure for test items, which provides a measure of the validity of each item compared to the test as a whole. A point biserial correlation was calculated for each of the items on the test. A "t"-test was used to test the significance of each item correlation from zero. Any item which had a probability value greater than .05 was removed from the test. Eleven items were eliminated from the instrument using the "t"-test criterion leaving sixty-one items still on the ADMS.

Nine more items were dropped from the instrument either because of duplication of scale values or overloading the instrument with items from a given

subcategory of the affective continuum. After the different discriminatory techniques were applied to the one hundred and ten items fifty-two items remained for the final ADMS. These fifty-two items on the final ADMS were divided into two forms. This was done to make the instrument more adaptable to pretesting and posttesting. One form may be used for the pretest exercise and the other one for the posttest exercise. The whole test and both forms have median scores of 5.8.

Validity of the ADMS

The validity of the ADMS was determined by computing a coefficient of correlation between scores obtained on the ADMS and each of two other instruments. The coefficients of correlation were calculated using the Pearson product-moment correlation coefficient between the one hundred and ninety student responses on the ADMS and the two selected instruments. A value of .64 for student scores on the ADMS and on the "Attitude Toward Any School Subject" and a correlation of .26 between the student scores on the ADMS and on the "Attitude Toward the Aesthetic Value" were obtained. The .64 correlation was considered satisfactory although the .26 was considered low. However, this low correlation could be expected since the ADMS measures a much wider span of the affective domain than does the instrument "Attitude Toward the Aesthetic Value" (this instrument had a tendency to spread only six of the eleven subcategories of Krathwohl's continuum).

Reliability of the ADMS

One hundred and ninety student responses were used to calculate three reliability coefficients for the ADMS. Two coefficients of correlation were calculated using the scores of the two halves given at the beginning of the semester and also at the end of the semester. The check at the end of the semester was made to determine consistency of the ADMS. Reliability values of .86 and .89 were found respectively for the whole test using the Spearman-Brown formula.

The third reliability coefficient was made using the test-retest technique. The ADMS was scrambled and readministered seven calendar days later for the retest measurement. The Pearson product-moment statistic was used to calculate the reliability coefficient and a value of .85 was found.

AFFECTIVE DOMAIN MEASURING SCALE (ADMS)

Please read each of the following statements very carefully. Place a check mark (✓) in the parentheses if you agree with the statement. Place a cross (X) in the parentheses if you disagree with the statement. If you cannot decide about a statement, you may place a question mark beside it.

There are no right or wrong answers to these statements. Students differ in their opinions on them. Just indicate your opinion by placing a check beside those statements with which you agree and placing a cross beside those with which you disagree.

(✓) Indicates you agree
(X) Indicates you disagree

Form A

Scale* Values		
9.2	1	I find most of the material in this class interesting.
8.3	2	Because of my studying science I have formed judgements as to how the national respect for science can be related to the directions in which American society will move in the next ten years.
9.0	3	I find it very easy for me to be completely aware of the information to be learned in most laboratory exercises.
2.9	4	Hardly any of the material studied in this class intrigues me.
2.6	5	Most all activities done in this class bore me.
1.2	6	I never get any enjoyment out of solving a science problem.
9.5	7	I often seek out friends who have done the science assignments to discuss the ideas in these assignments that have stimulated me.
9.4	8	I believe that rules for regulating laboratory equipment usage are important and essential.

3.5	9	I seldom help initiate group action in solving a scientific problem.
9.6	10	I enrolled in science classes in my earlier schooling and I plan to enroll in more science classes in my future education because of the great personal worth I gain from the classes.
7.1	11	My science class provides the setting for me to be encouraged by finding that other people are often troubled by the same sorts of problems and difficulties I am.
3.4	12	I feel that my science class contributes very little to help me understand myself and my problems more clearly.
8.4	13	I very often check out library books pertaining to science.
4.5	14	None of my hobbies directly or indirectly pertain to science.
2.4	15	I have never been motivated by my science class to become interested in any new projects.
8.1	16	I gain a lot of gratification from reading about new scientific developments.
8.5	17	I seldom need persuasion to perform the laboratory exercises.
3.1	18	Everybody can appreciate science, and for this purpose I find it not necessary for me to know a lot about science.
9.1	19	I attain a good deal of happiness when I can successfully help someone with his science problems.
2.1	20	I have done nothing in the science class that will help me to form judgements of the type of life I will lead.
3.8	21	Through the act of judging I contend that science is responsible for man's desire to make war.
7.5	22	I usually complete homework assignments, whether I want to or not.

2.3	23	I can think of nothing more worthless than aiding in the planning of a science fair.
1.6	24	I think all science homework assignments are unnecessary and furthermore I never do them.
4.1	25	I seldom discuss with friends the most popular science news.
8.7	26	I usually assume an active role in laboratory activities.

Form B

9.5	1	When I solve a science problem, I get a good feeling of satisfaction.
9.4	2	I do most of my science assignments, not because the teacher wants me to, but for my own personal value.
8.7	3	I am quite interested in helping other students to attain satisfaction for understanding scientific principles.
3.7	4	I am often "indifferent" toward the content of this course.
9.3	5	I am almost always careful in getting the best answers possible to all assignments handed in.
9.2	6	I personally get a lot of pleasure out of completing and obtaining some good results in a laboratory exercise.
9.9	7	Because of my science class I have become interested in such problems as pollution, conservation, and space exploration.
8.4	8	I have a high "conviction" for the importance that science plays in personal and community life.
9.6	9	I like to analyze, compare, and criticize the different points of view presented in this class.
3.4	10	I do my assignments chiefly because my parents and teachers urge me to do so.

3.9	11	It is quite unusual for me to compare my opinion of a concept in science with that of someone else.
8.9	12	I get great satisfaction from my science class in gaining insight into the beauties and complexities of science problems.
4.0	13	I never read scientific articles, apart from school requirements.
2.4	14	I dislike to listen to lectures or discussions carried on in this class.
1.3	15	I never agree with the teacher's authority relating to classroom exercises.
4.5	16	It is rather unusual for me to discuss science problems and science achievements with friends.
8.0	17	I frequently better understand my own ethical standards and personal goals through the studying of science.
2.8	18	In no way will the information disseminated in my science class effect my strong beliefs about cigarette smoking.
1.7	19	All science is designed for "squares," and I can <u>not</u> see how anyone can enjoy it.
9.0	20	I easily follow the leads suggested by the teachers.
4.2	21	Most of "my rules" that I live by, from day to day, are not affected by my enrollment in science.
2.0	22	My science class provides me with <u>no</u> ideas which I can make as part of my philosophy of life.
2.6	23	I would rather sit back and watch my partners do a laboratory experiment than be actively involved.
7.2	24	The spirit of a period can best be expressed in the contributions made by science.

8.2	25	When I read my textbook, I am almost always conscious of the ideas being expressed by the authors.
2.2	26	My science class never contributes to the ideals which I live by.

*Note: The score for the individual answering the test is computed by finding the median scale value of the items with which he agrees.

When administered to the students for measuring purposes, the scale values are omitted, and a set of parentheses is placed to the left of each item.